इंटरनेट मानक

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IS 366 (1991): Electric irons [ETD 32: Electrical Appliances]

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(चौथा पुनरीक्षण)

Indian Standard
ELECTRIC IRON - SPECIFICATION
(Fourth Revision)

First Reprint AUGUST 1998

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1991

Price Group 5

AMENDMENT NO. 1 OCTOBER 1993
TO
IS 366 : 1991 ELECTRIC IRON — SPECIFICATION

(Fourth Revision)

(*Page* 10, *clause* **18.1**) — Replace second sentence by the following:

'Before commencement of the tests the Electric Iron shall be visually examined and inspected for obvious visual defects in respect of components, parts, and their assembly construction, stability, markings, provisions of suitable terminals for supply connection, earthing and the effectiveness of screws and connections.'

[*Page* 2, *clause* **12.2** (d), *line* 2] — Substitute 'end' *for* 'and'.

(*Page* 6, *clause* **16.2**, *para* 2, *line* 3) — Substitute 'of 40 mm at a rate of about five drops per minute' in place of 'of 40 cm at a rate not exceeding five drops per minute'.

(ETD 32)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 2 NOVEMBER 1994
TO
IS 366 : 1991 ELECTRIC IRON — SPECIFICATION

(Fourth Revision)

(*Page* 1, *clause* **11.3**) — Insert the following at the end:

'The sole plate temperature shall not exceed 260°C.'

(*Page* 1, *clause* **11.4**) — Insert the following at the end:

'The sole plate temperature shall not exceed 260°C.'

(*Page* 2, *clause* **11.5**) — Substitute the following for the existing matter:

'It shall be possible to achieve sole plate temperature of at least 70°C at the lowest and 200°C at the highest setting of thermostat in the case of thermostatic electric irons.

NOTE — Recommended temperature range of ironing for different types of fabrics are given as under:

Fabric	*Temperature* (°C)
Nylon	70 to 90
Rayon	100 " 120
Silk	130 " 150
Wool	160 " 180
Cotton/Linen	190 " 210

This is for the guidance of the manufacturers only.'

(*Page* 8, *clause* **17.2.2**) — Insert the following Note at the end:

'NOTE — The test shall be kept in abeyance till further amendment.'

(ETD 32)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 3 APRIL 1995
TO
IS 366 : 1991 ELECTRIC IRON — SPECIFICATION

(Fourth Revision)

(*Page* 1, *clause* **9.1**) — Substitute the following for the existing clause:

'**9.1** The electric iron shall meet the safety requirements as given in **8** to **32** of IS 302-2-3 (1992) except **9**, **14**, **17**, **21.101** and **32**.'

(*Page* 5, *clause* **16.1**, *para* 3) — Substitute the following for the existing para:

"The iron is operated continuously, or for a corresponding number of periods, each period being not less than 8 hours. The iron is operated until the total sum of 'ON' period reaches 200 hours. Immediately after this the average sole plate temperature T_2 is determined as for T_1."

(*Page* 6, *clause* **16.2.1**, *Note*) — Delete.

(*Page* 10, *Table* 3, *col* 3, *row* 1) — Substitute the following for the existing matter:

'As given in **8** to **32** of IS 302-2-3 (1992) (except for test given in **9**, **14**, **17**, **21.101** and **32**).'

(*Page* 10, *Table* 3) — Insert the following note at the end of the table:

> 'NOTE — The test for PTFE coating given in **17.2** shall be kept in abeyance till further amendment.'

(ETD 32)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 4 MARCH 1996
TO
IS 366 : 1991 ELECTRIC IRON — SPECIFICATION

(Fourth Revision)

(*Page* 1, *clause* 10.4) — Substitute the following for the existing matter:

'**10.4** The heating up time shall not exceed 4 minutes for electric iron of aluminium alloy sole plate and 8 minutes of cast iron sole plate.'

(*Page* 2, *clause* 11.5) — Add the following note at the end:

'NOTE — For those irons whose thermostat settings are indicated by a section the setting shall be at the centre of the marking of range.'

(*Page* 3, *clause* 14.2, *line* 2) — Substitute '20°C' *for* '12.5°C'.

(*Page* 6, *clause* 17.2.2, *para* 2) — Insert the following note after this para:

'NOTE — The hardness of the cutting tool shall be about 200 BHN.'

(ETD 32)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 5 APRIL 1998
TO
IS 366 : 1991 ELECTRIC IRON — SPECIFICATION

(Fourth Revision)

(*Page* 10, *clause* **18.1**) — Substitute the following for the existing matter:

'The test specified in Table 3 shall constitute the type tests and carried out on a sample selected preferably at random from a regular production lot. Before commencement of the tests, the irons shall be visually examined and inspected for obvious visual defects in respect of components, parts and their assembly, construction, mechanical hazards, markings, provision of suitable terminals for supply connections, earthing and the effectiveness of screws and connections. The external surface finish shall be even and free from finishing defects.'

(*Page* 10, *clause* **18.1.1**, *first sentence*) — Substitute the word 'Sample' in place of 'Both samples'.

(ET 32)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 6 OCTOBER 2011
TO
IS 366 : 1991 ELECTRICAL IRONS — SPECIFICATION

(Fourth Revision)

(*Page* 10, *clause* **18.1.1) —** Substitute the following for the existing:

'**18.1.1** *Criteria of acceptance*

Sample shall successfully pass all the type tests for proving conformity with the requirements of the standard. If the sample fails in any of the type tests, the testing authority at its discretion may call for fresh sample not exceeding twice the original number and subject them again to all tests or to the test(s) in which failure(s) had occurred. No failure should be permitted in the repeat test(s).'

(ET 32)

Reprography Unit, BIS, New Delhi, India

Electrical Appliances Sectional Committee, ETD 32

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Electrical Appliances Sectional Committee had been approved by the Electrotechnical Division Council.

The standard covers the general, safety and performance requirements of Electric Iron.

This standard was originally published in 1965. The first revision was done in 1965, second revision in 1976 and third revision was in 1985. As per the decision of the 3rd meeting of Electrotechnical Division Council separate safety standard on electric iron has been brought out. In the fourth revision of this composite standard instead of giving details of safety requirements, reference has been made to the respective safety standard IS 302-2-3 : 1992 Safety requirements for household and similar electrical appliances: Part 2 Particular requirements: Section 3 Electric iron. The present revision also takes into account the amendments that have been issued since the last publication of the standard.

While preparing this standard assistance has been derived from IEC Publication 311 (1988) Method of measurement of performance of electric iron for household or similar use.

This standard does not apply for steam irons which are covered in IS 6290 : 1986 Specification for steam irons (*first revision*).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value shauld be the same as that of the specified value in the standard.

Indian Standard

ELECTRIC IRON — SPECIFICATION

(Fourth Revision)

1 SCOPE

1.1 This standard covers the general safety and performance requirements of electric iron used for household and similar purposes.

In addition, the provision of 1 of IS 302-2-3 (1992) shall also apply.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
302-1(1979)	Safety of household and similar electrical appliances: Part 1 General requirements (*fifth revision*)
1068:1985	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel (*second revision*)
302-2-3 (1992)	Safety of household and similar electrical appliances : Part 2 Particular requirements, Section 3 Electric iron

3 TERMINOLOGY

3.1 The provision of 2 of IS 302-2-3 (1992) shall apply.

4 GENERAL REQUIREMENTS

4.1 The provision of 3 of IS 302-2-3 (1992) shall apply.

5 GENERAL NOTES ON TESTS

5.1 The provision of 4 of IS 302-2-3 (1992) shall apply.

6 RATING

6.1 The provision of 5 of IS 302-2-3 (1992) shall apply.

7 CLASSIFICATION

7.1 The provision of 6 of IS 302-2-3 (1992) shall apply.

8 MARKING

8.1 The provision of 7 of IS 302-2-3 (1992) shall apply.

9 SAFETY REQUIREMENT

9.1 The electric iron shall meet the requirements as given in **8** to **32** of IS 302-2-3 (1992) except **9**, **14**, **17** and **32.**

10 MEASUREMENT OF HEATING-UP TIME

10.1 The iron is placed on the three pointed metallic supports while under measurement. The three pointed supports are constructed so that they support the sole plate of the iron horizontally at least 100 mm above the base surface on which the iron is placed. The thermocouple is attached at the mid-point of the sole plate (*see* Fig.1).

10.2 Starting from ambient temperature, the iron is heated up with the voltage corresponding to rated input, the thermostat, if any set at the highest temperature. Where a rated voltage range is specified, this voltage should correspond to the voltage corresponding to mean rated input.

10.3 The heating-up time which is the time necessary for temperature of the sole plate to exceed the ambient temperature by 180°C or at least a final temperature of 200°C including ambient is measured, and is expressed in minutes and seconds.

10.4 The heating up time shall not exceed 8 minutes

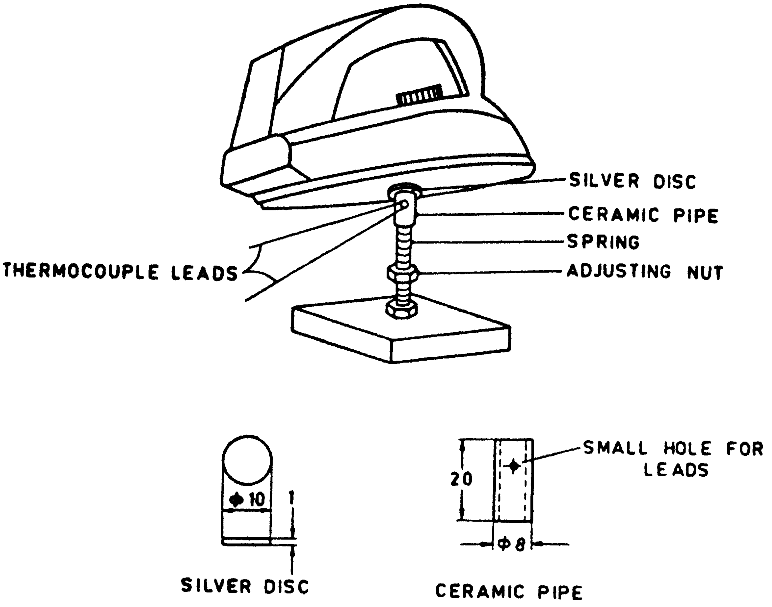
11 MEASUREMENT OF SOLE PLATE TEMPERATURE

11.1 The iron is placed on the three metallic supports (*see* **10**) and the thermocouple is attached at the mid point of the sole plate (*see* Fig. 1). The iron is switched on and heated with a voltage corresponding to rated input.

11.2 For thermostatic iron the highest and the lowest temperatures are measured during five successive cycles of temperature variation after the iron has reached the steady state conditions. The mean value of the five highest and lowest temperatures is the sole plate temperature for the setting. This test is repeated for each setting of the thermostat.

11.3 For irons with self resetting thermal cut-out the measurement shall be carried out in the same way as for thermostatic type.

11.4 For other types of irons, the highest sole plate temperature shall be measured after the iron has reached steady state conditions.



NOTE — A thermocouple is soldered at the centre of the silver disc. The silver disc is fixed to the end of the ceramic pipe with heat-resistant adhesive.

FIG. 1 2-WAY OF ATTACHING THERMOCOUPLES

NOTES

1 The steady state temperature is considered to be achieved if the temperature at the mid-point of the sole plate does not vary by more than 1°C per hour.

2 For those irons whose thermostat settings are indicated by a sector the setting shall be at the centre of the range.

3 The adjustment of the thermostat control to obtain the required setting shall be made in the direction of increasing temperature.

11.5 It shall be possible to achieve sole plate temperature of at least 70°C at the lowest and 200°C at the highest setting of thermostat in the case of thermostatic electric irons. Recommended temperature range of ironing for different types of fabrics are given as under:

Fabric	*Temperature* (°C)
Nylon	70 to 90
Rayon	100 to 120
Silk	130 to 150
Wool	160 to 180
Cotton/Linen	190 to 210

12 MEASUREMENT OF TEMPERATURE DISTRIBUTION

12.1 The iron is placed on the three metallic supports (*see* **10**) and is heated up with the voltage specified in **10** until the sole plate temperature at the mid-point exceeds 200°C. Then after switching off the supply, the iron is placed for a suitable period, on a sheet of white paper spread over flannel cloth which covers a wooden board. After removal of the iron, darkening of the paper indicates the temperature distribution over the sole plate. The hottest point is determined as the centre of the darkest area.

NOTE — Positive phototype paper, which is unexposed and developed, white tracing paper, or white blotting paper is recommended as the white paper for this measurement.

12.2 After this iron is placed on three metallic supports (*see* **10**) and a thermocouple is attached at each of the following four points of the sole plate:

a) The hottest point determined in **12.1**,

b) The mid-point of the sole plate,

c) The point on the longitudinal centre line 20 mm from the tip of the sole plate, and

d) The point on the longitudinal centre line 20 mm from the heal and of the sole plate.

For a thermostatic iron, the thermostat is set so that the temperature at the mid-point is maintained at approximately 150°C under the steady-state conditions, and the measurement is performed after the iron has reached the steady-state conditions.

For other types of irons, the temperature at the mid-point is maintained at approximately 150°C for at least 15 minutes by switching the supply on and off before taking temperature measurements.

The varying temperature is recorded for 10 minutes and the average temperature for the 10 minutes is determined for each of the four points. The mean of the four average temperatures is then determined, and the difference between each average temperature and the mean temperature is also calculated. The four temperature differences are recorded as the indication of the temperature distribution over the sole plate.

12.3 Any of the four temperature differences recorded in the above test shall not differ by more than 10°C.

13 MEASUREMENT OF INITIAL OVERSWING TEMPERATURE AND HEATING-UP EXCESS TEMPERATURE

13.1 The iron is placed on the three metallic supports (*see* **10**) and a thermocouple is attached at the hottest point determined as in **12.1**. The iron is then switched on and thermostat is adjusted so that an average temperature of about 120°C is maintained at the measuring point under the steady state conditions. The iron is allowed to cool down to room temperature. The iron is switched on again and, using a recording type instrument, the time and temperature are measured at the hottest point from switching on over nine successive cycles to produce a graph of the type shown in Fig. 2.

13.2 From the graph the following are determined:

a) The initial overswing temperature, which is the first peak temperature between the first and second cut-outs of the thermostat;

b) The mean peak temperature which is the mean value of the last five peak temperatures; and

c) The heating up excess temperature, which is the difference between the initial overswing temperature and the mean peak temperature.

13.3 The initial overswing temperature shall not be more than 165°C and the heating-up excess temperature shall not exceed 30°C.

13.4 This test is applicable to thermostatic irons only.

14 MEASUREMENT OF CYCLIC FLUCTUATION OF TEMPERATURE

14.1 Measurement is the same as in **13** except that highest and lowest temperatures of each cycle are measured for five successive cycles after the iron has reached the steady-state conditions. The mean value for the highest temperatures and that for the lowest temperatures are determined. One half of the difference between the mean values is the cyclic fluctuation of the temperature of the hottest point and is expressed in Celsius degrees.

NOTE — This measurement may be combined with the measurement in **13**.

14.2 The cyclic fluctuation of the temperature of the hottest point shall not exceed 12.5°C.

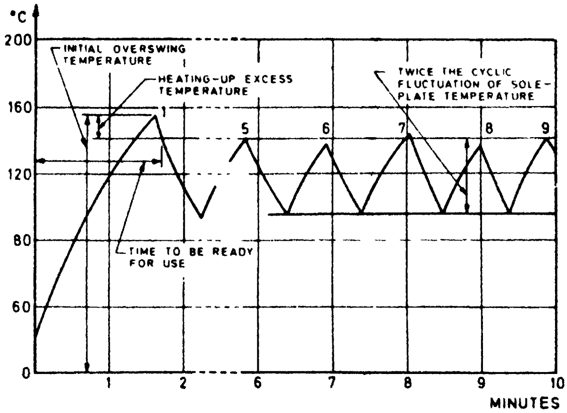


FIG. 2 VARIATION OF SOLE-PLATE TEMPERATURE AFTER SWITCHING ON

14.3 This test is applicable to thermostatic irons only.

15 MEASUREMENT OF TEMPERATURE DROP UNDER LOAD

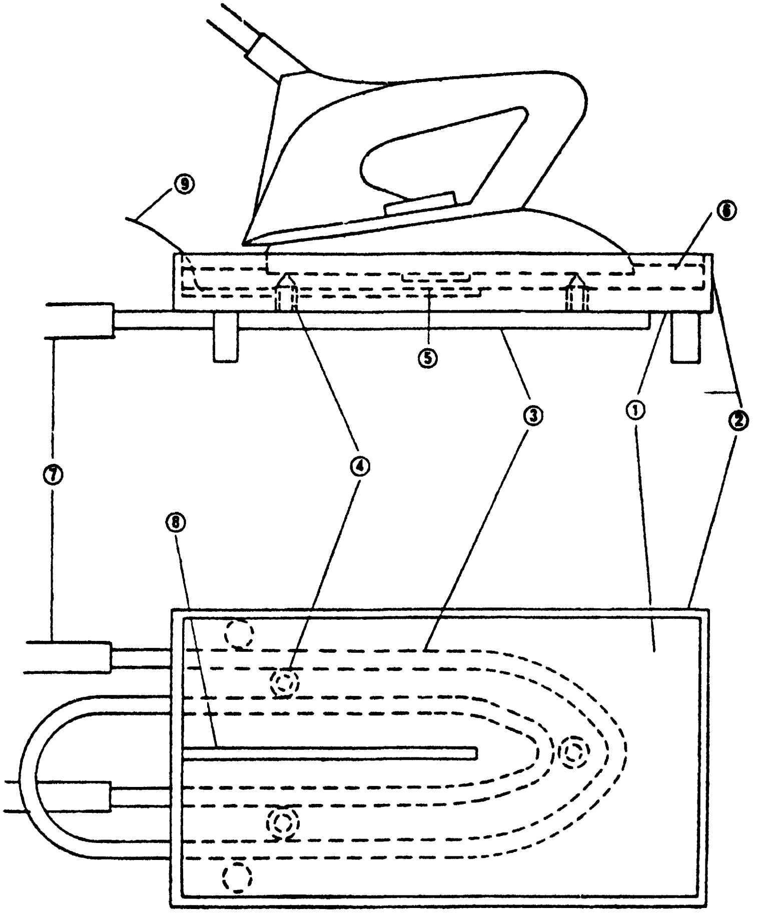
15.1 Measurement of Temperature and Average Input Power under Idling Operation

The iron is placed on the three metallic supports (*see* **10**), and a thermocouple is attached at the mid-point of the sole plate. The iron is then switched on and the thermostat is adjusted so that an average temperature of 200 ± 10°C is maintained under the steady-state conditions.

After the iron has reached the steady state conditions, the highest and the lowest temperature for five successive cycles are measured, and the mean temperature T_1 for them is determined. At the same time, the average power W_1 of the input consumed under the steady state conditions is determined by dividing the electric energy in watthours consumed in the course of at least five regulating cycles by the total duration of these cycles.

15.2 Measurement of Temperature and Average Input Power Under Load

The iron is placed on the supports of the measuring apparatus illustrated in Fig. 3 and switched on with the same thermostat as for **15.1**.



1 Copper base plate
2 Edge of the base plate
3 Cooling pipes
4 Pointed supports
5 Silver disc with a thermocouple
6 Silicone oil
7 Cooling water pipes
8 Slot in thebase plate for thermocouple leads
9 Thermocouple leads

NOTE — The base plate (1) is made of copper plate 10 mm to 15 mm thick. Around the periphery of the base plate, the edge (2) about 10 mm high is soldered, so that the plate forms a shallow vessel for silicon oil. Cooling pipes of copper (3) are soldered to the lower surface of the base plate, and are connected to cooling water pipes (7). Three pointed supports (4) are provided on the base plate. The height of the supports can be adjusted from 1 mm to 2 mm. The silver disc with a thermocouple (5) is placed at the mid-point of the soleplate, and it must not touch the base plate. The base plate of the apparatus is held horizontally and is filled with silicone oil 3 mm to 4 mm deep.

FIG 3 APPARATUS FOR MEASURING TEMPERATURE DROP UNDER LOAD

The flow rate of cooling water is adjusted so that the temperature difference between outgoing and incoming water does not exceed 10°C after steady condition is reached.

The height of the pointed supports is determined in a preliminary test in such a way that the average input power absorbed by the iron is about 50 percent of the rated input.

After ten successive cycles of operation of the thermostat, it is assumed that steady condition is reached. The average power W_c of the input and the mean temperature T_c of the sole plate under load are determined, as for the idling case in **15.1**.

15.3 For irons with self resetting thermal cut-out the measurements at **15.1** and **15.2** shall be carried out in the same way as that of thermostatic type. For other types of irons, the above measurements are carried out similarly after the iron has reached the steady-state conditions.

15.4 Calculation of Temperature Drop Under Load

The measured temperature drop under load is the difference $T = T_1 - T_c$, T_1 and T_c being respectively the mean temperature under idling and load determined in **15.1** to **15.3**.

The temperature drop per 100 W load is calculated by the formula:

$$T\ 100 = \frac{T \times 100}{W_c - W_1}$$

where

W_c = the average input power under load, and

W_1 = the average input power under idling.

15.5 The temperature drop under load shall not exceed 10°C.

16 MEASUREMENT OF THERMOSTATIC STABILITY

16.1 Endurance Test

The iron is placed on the three metallic supports and a thermocouple is attached at the mid point of the sole plate. The iron is then operated at 1.15 times the maximum rated input. In case of thermostatic iron, the thermostat is set so that an average temperature of about 200°C is maintained under steady state conditions. The setting of the thermostat is fixed in an appropriate way so that the settings do not change during the measurement. For irons without thermostat or self resetting thermal cutouts, the temperature of the sole plate shall be maintained between 205°C and 260°C by suitable cooling means such as a jet of air on a cooling plate.

In the case of thermostatic electric iron the average temperature T_1 is determined as in the case of measurement of sole plate temperature.

The iron is then operated for 11 h and then it is switched off for 1 h. The cycle, consisting of an on period of 11 h and off period of 1 hour is repeated until the total sum of on period reaches 200 h. Immediately after this the average sole plate temperature T_2 is determined as for T_1.

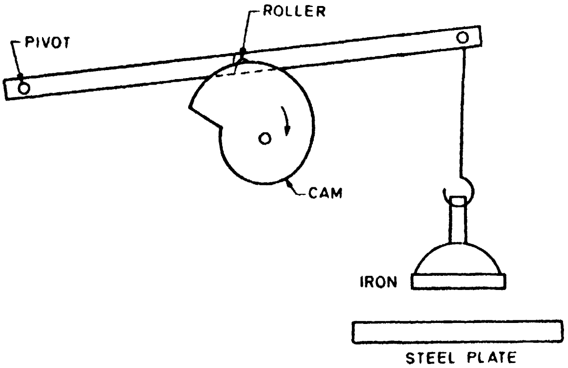


FIG. 4 APPARATUS FOR DROP TEST

16.1.1 After the test the thermostatic iron and iron with or without self resetting thermal cutout shall withstand the electric strength test as given in **16.4** of IS 302-1 (1979) and also there shall be no exposure of live part caused by breakage or distortion of the enclosure.

16.1.2 The difference of T_2 and T_1 is indication of the Thermostatic stability of Thermostatic Electric Iron.

NOTE — Specific value of Thermostatic stability (difference of T_2 and T_1) are under consideration.

16.2 Drop Test

This test is performed immediately after the measurement in **16.1** with the thermostat fixed at the same setting.

The thermocouple is removed from the sole-plate and the iron is subject to a thousand drops from a height of 40 cm at a rate not exceeding five drop per minute. When the iron drops, it should strike in a horizontal position on a rigidly supported flat steel plate at least 15 mm thick and at least 15 kg in mass (Fig.4 illustrates the test device). During the drop test, the iron is connected to the power supply. The machine is so designed that the iron rests on the steel plate for approximately 15 percent of the duration of the test and the sample is so mounted that there is no additional weight which would influence the impact energy.

Immediately after the drop test, the average temperature T_3, at the mid-point is determined as for T_1 (*see* **15.1**).

16.2.1 After the test as an indication of the thermostatic stability the difference of T_3 and T_1 in the case of thermostatic iron shall not change its calibration by more than +10°C or -20°C. Also there shall be no exposure of live parts caused by breakage or distortion of the enclosure and also shall not show damage within the meaning of the standard.

NOTE — The test may be combined with the test given in 21.101 of IS 302-2-3(1991).

17 FINISH

17.1 Determination of Electroplated Coating on Sole Plate

17.1.1 The external finish used on ferrous components shall be of a heat and moisture resisting nature and shall not be adversely affected by variation in temperature under normal operating conditions or during the endurance test as given in **16.1**. The nickel and chromium electroplated coating shall conform to the following requirements:

- —10 micrometers (microns) of nickel plus
- —0.2 micrometers (microns) of chromium

17.1.2 The compliance is checked for the following requirements according to the test methods given in IS 1068 : 1985:

a) Thickness of coating,

b) Adhesion, and

c) Corrosion.

NOTE — The thickness of electroplated coatings may be measured by BNF Jet test method and stripping method given in Appendix K and L of IS 302-1(1979). However, in case of dispute the test shall be carried out as prescribed in IS 1068 : 1968.

17.2 Determination of Adhesive of Polytetraflurothylene (PTFE) Coating or Similar Coating on Sole Plate

17.2.1 The iron is fixed on a suitable support and a thermocouple is attached at the mid-point of the sole-plate if the sole-plate is coated with PTFE or similar material.

The iron is switched on, with the voltage corresponding to the rated input, and the thermostat is adjusted so that an average sole-plate Temperature of approximately 150°C is maintained under steady state conditions. (Where a rated voltage range is specified, this voltage should correspond to mean rated input).

For a non-thermostatic iron, the temperature at the mid-point of the sole-plate is maintained at 150 ± 10°C by switching the supply on and off.

The temperature is maintained for at least 30 min.

17.2.2 The cross-cut test is performed with the temperature at the flat part of the sole plate maintained at approximately 150°C.

A cutting tool with six cutting edges is used in each direction of the lattice pattern (*see* Fig. 5).

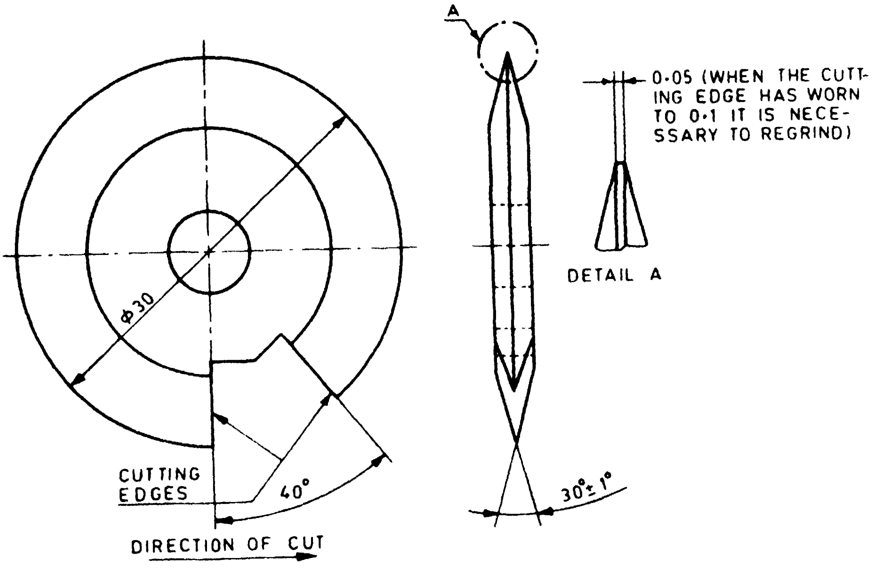
If each cut does not penetrate the coating uniformly to the surface of the substratum, because of the curvature of the sole-plate a single edge cutting tool may be used.

The spacing of the cuts is 1 mm in each direction.

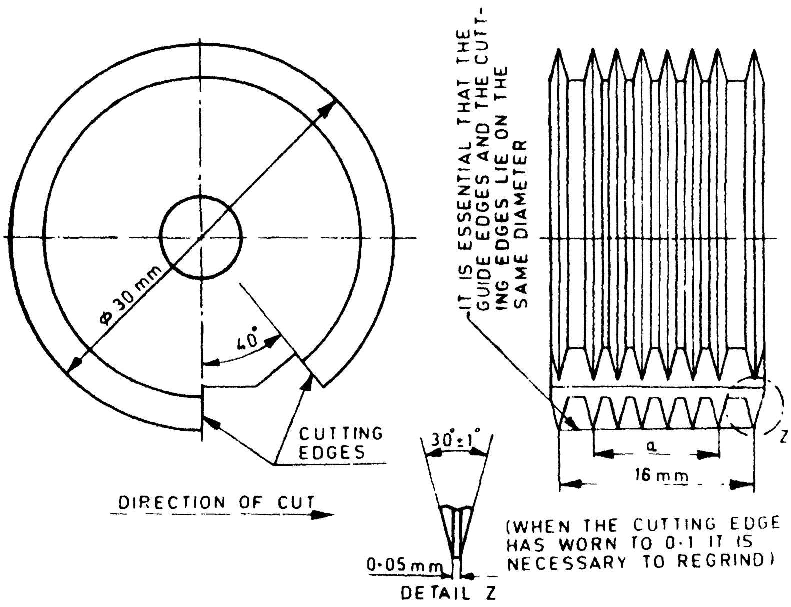
The cutting tool is applied in a plane normal to the test surface and the cut shall be at a rate of 20 mm/s to 50 mm/s with uniform pressure. The cuts are made at four different positions on the sole-plate, and form 25 squares at each position.

Two of the positions are positioned approximately 50 mm apart from each other on the longitudinal centre line, the others being positioned in the centre between the mid point of the centre line and both edges of the sole plate.

After cooling down to room temperature (27 ± 5°C), the sole-plate is brushed lightly with a soft brush five times backwards and five times forwards along both lines of the lattic pattern.


A
0·05 (WHEN THE CUTTING EDGE HAS WORN TO 0·1 IT IS NECESSARY TO REGRIND)
DETAIL A
ϕ30
CUTTING EDGES
40°
30°± 1°
DIRECTION OF CUT

A — SINGLE CUTTING TOOL


IT IS ESSENTIAL THAT THE GUIDE EDGES AND THE CUTTING EDGES LIE ON THE SAME DIAMETER
ϕ 30 mm
40°
Z
a
16 mm
CUTTING EDGES
30°±1°
DIRECTION OF CUT
(WHEN THE CUTTING EDGE HAS WORN TO 0·1 IT IS NECESSARY TO REGRIND)
0·05 mm
DETAIL Z

B — MULTIPLE CUTTING TOOL

All dimensions in millimetres.

FIG 5 CUTTING TOOLS

Appropriate adhesive tape is then applied firmly over the area of lattice. The tape is then pulled off quickly to remove the flaked portion of the coating.

NOTE — For this test the following adhesive tape is recommended : Polyster film tape with non thermosetting adhesive (width = 25 mm, Thickness > 0.02 mm). The tape shall comply with the requirements given in Table 1.

The test result is evaluated by observation of the cut surface at each position, and classified according to Table 2.

Tests are carried out on four positions on the soleplate and only the worst lattice pattern is used for evaluation.

17.3 Resistance to Rusting

17.3.1 Ferrous parts, the rusting of which might cause the appliance to fail to comply with this standard, shall be adequately protected against rusting.

Compliance is checked by the following test:

> All grease is removed from the parts to be tested by immersion in carbon tetrachloride or trichlorethane for 10 minutes.
>
> The parts are then immersed for 10 minutes in a 10 percent solution of ammonium chloride in water at a temperature between 15°C and 35°C.
>
> Without drying, but after shaking off any drops, the parts are placed for 10 minutes in a box containing air having not less than 90 percent RH and temperature between 15°C and 35°C

After the parts have been dried for 10 minutes in a heating cabinet at a temperature of 100 ± 5°C, their surfaces shall shown no signs of rust.

Traces of rust on sharp edges and any yellowish film removable by rubbing are ignored.

For small helical springs and the like, and for parts exposed to abrasion, a layer of grease may provide sufficient protection against rusting. Such parts are only subjected to the test if there is doubt about the effectiveness of the grease film. The test is then made without previous removal of the grease.

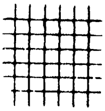
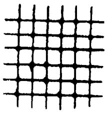
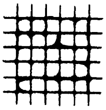
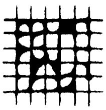
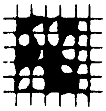
Table 1 Requirement of Tape

(*Clause* 17.2.2)

Property	Unit	Requirements
Electrolytic corrosion after 24 h at 23 + 2°C and 93 + 2% relative humidity		1 × 10^{11} minimum central value
Temperature index		Not less than 130°C
Tensile strength	N/10 mm	600 minimum per millimetre thickness
Elongation-at-break	%	75 minimum
Adhesion to steel	N/10 mm	2 minimum for thickness ≤ 0.02 mm 3 minimum for thickness > 0.02 mm
Adhesion to backing	N/10 mm	2 minimum central value
Electrical strength at room temperature after 24 h at 23 ± 2°C and 93 ± 2% relative humidity	kV/mm	70 minimum

Table 2 Classification of Test Results

(*Clause* 17.2.2)

Classification	Description	Appearance of Surface of Cross-Cut Area from Which Flaking has Occurred (Example for Six Parallel Cuts)
0	The edges of the cuts are completely smooth; none of the squares of the lattice is detached.	
1	Detachment of small flakes of the coating at the intersections of the cuts. A cross-cut area not distinctly greater than 5 percent is affected.	
2	The coating has flaked along the edges and/or at the intersections of the cuts. A cross-cut area distinctly greater than 5 percent, but not distinctly greater than 15 percent is affected.	
3	The coating has flaked along the edges of the cuts partly or wholly in large ribbons, and/or it has flaked partly or wholly on different parts of the squares. A cross-cut area distinctly greater than 15 percent, but not distinctly greater than 35 percent is affected.	
4	The coating has flaked along the edges of the cuts in large ribbons and/or some squares have detached partly or wholly. A cross-cut area distinctly greater than 35 percent, but not distinctly greater than 65 percent is affected.	
5	Any degree of flaking that cannot even be classified by classification 4.	

18 TESTS

18.0 Categories of Tests

Tests are classified as type, acceptance and routine tests.

18.1 Type Tests

The tests specified in Table 3 shall constitute the type tests and shall be carried out on two samples of irons of the same type and rating selected preferably at random from a regular production lot. Before commencement of the tests, the irons shall be earthing and the effectiveness of screws and connections. The external surface finish shall be even and free from finishing defects.

18.1.1 *Criteria of Acceptance*

Both samples shall successfully pass all the type tests for proving conformity with the requirements of the standard. If any of the samples fails in any of the type tests, the testing authority, at its discretion, may call for fresh samples not exceeding twice the original number and subject them again to all tests or to the test(s) in which failure(s) had occurred. No failure should be permitted in the repeat test(s).

18.2 Acceptance Tests

The following shall constitute the acceptance tests:

Test	*Clause Reference*
a) Protection against electric shock	8 of IS 302-2-3 (1992)
b) Input	10 of IS 302-2-3 (1992)
c) Temperature rise	11 of IS 302-2-3 (1992)
d) Electrical insulation and leakage current at operating temperature	13 of IS 302-2-3 (1992)
e) Moisture resistance	15 of IS 302-2-3 (1992)
f) Insulation resistance and electric strength (after humidity treatment)	16 of IS 302-2-3 (1992)
g) Earthing connection	27 of IS 302-2-3 (1992)
h) Heating-up time	10
j) Measurement of sole plate temperature	11

NOTE — For the purpose of acceptance tests, the humidity treatment shall be done for 24 hours while conducting the test for moisture resistance.

18.2.1 A recommended sampling procedure for acceptance tests is given in Appendix B of IS 302-1 (1979).

18.3 Routine Tests

The following shall constitute the routine tests:

Test	*Clause Reference*
a) Protection against electric shock	8 of IS 302-2-3 (1992)
b) High voltage	13.3.2 of IS 302-1(1979)
c) Earthing connection	27 of IS 302-2-3 (1992)

Table 3 Schedule of Type Test

(*Clause* 18.1)

Sl No.	Test	Clause Reference
i)	Safety Requirement	8 to 32 of IS 302-2-3 (1992) (Except for test given in clauses 9, 14, 17 and 32)
ii)	Measurement of heating up time	10
iii)	Measurement of sole plate temperature	11
iv)	Measurement of temperature distribution	12
v)	Measurement of overswing temperature and heating up excess temperature	13
vi)	Measurement of cyclic fluctuation of temperature of hottest point	14
vii)	Measurement of temperature drop under load drop under load*	15
viii)	Measurement of thermostatic stability	16
ix)	Finish	17

*This test shall be kept in abeyance till further amendment.

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